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The Neotropical Species of *Deuterixys* Mason (Hymenoptera: Braconidae)

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Abstract.—The neotropical species of the braconid wasp genus *Deuterixys* Mason are revised for the first time. Seven species are recognized, four of which are new to science: ***D. colombiana, D. erythrocephala, D. hansoni,*** **and *D. tehuantepeca.*** The remaining three species, *D. bennetti* Whitfield, *D. pacifica* Whitfield and *D. quercicola* Whitfield, were previously known from the Nearctic region but are found to range into the Neotropical. An illustrated identification key is presented for the New World species.

Our taxonomic knowledge of parasitoid wasps in tropical parts of the world, including the Neotropical Region, is notoriously incomplete. It is especially so for parasitoids whose hosts are also less well understood, for example the microlepidoptera as a group. Small caterpillars tend to be less conspicuous and more difficult to identify than larger host insects, and thus relatively few accurate host-parasite records are available for them, except in well-surveyed areas. As an example of this, Whitfield and Mason (1994) described a new subfamily of braconid wasps that appears to attack concealed microlepidopterans, and this subfamily now is known to contain at least 10–15 species distributed from South America to the southeastern U. S., some of which are still being discovered every few years (Valerio and Whitfield, 2000; Yamada and Penteado-Dias, 2002; Valerio and Whitfield, 2002). Several genera of the subfamily Microgastrinae are estimated to contain at least 100 neotropical species, only a handful of which are currently described (Mason, 1981, Whitfield, 1997). Thus it comes as no surprise that the revision presented here for the species of *Deuterixys* Mason in the Neotropical Region began with absolutely no published information about any of the species in the area under study.

The genus *Deuterixys* was erected by Mason (1981) to house the species previously assigned by Nixon (1965) to the *carbonarius*-group of *Apanteles* Foerster. By 1985, four Palearctic species (Papp, 1983) and three Nearctic species (Whitfield, 1985, 1995) were known, to which Austin and Dangerfield (1992) added one Australian species. All host records so far assembled suggest that *Deuterixys* spp. always attack caterpillars in the genus *Bucculatrix* (Bucculatricidae), which in turn feed on a wide variety of plant families, most notably on Asteraceae (Whitfield, 1985). The wasps pupate within the elongate ribbed cocoons of their hosts, lining the host cocoon with some silk of their own. The revision we present below contains no host records from the Neotropical Region, but the best current guess is that the known pattern of specialization on *Bucculatrix* will be found to be true of this area as well.

Below we describe several new species of *Deuterixys* from the Neotropical region from specimens that we have found in major collections, and compare these putative new species to the previously known species of the genus. While we can make no pretense that the survey we are presenting is complete, it is intended to provide a first treatment of this distinctive genus, and should serve to make the included species more recognizable to neotropical scientists.

This is a difficult genus in which to delimit species, especially due to the limited material for some species, the small body size, and substantial intraspecific variability in body coloration and intensity of sculpturing. We recommend using the key below first, but strongly recommend following this by checking the resulting identifications by consulting the descriptions and the figures.

The genus appears to be generally uncommon wherever it occurs in the world, although individual species can sometimes be easily collected once their host is located.

MATERIALS AND METHODS

Specimens for this study were originally sorted and brought together from several collections by the late W. R. M. Mason, and supplemented by specimens sorted by the senior author from several other collections. The collections and curators responsible for loaning these specimens are thanked in the *Acknowledgments.* Museum abbreviations in the *Specimens Examined* sections are as follows: AEI: American Entomological Institute, Gainesville; CNC: Canadian National Insect Collection, Ottawa; Humboldt: Humboldt Institute, Villa de Leyva, Colombia; INBio: Instituto Nacional de Biodiversidad, Costa Rica; MCZ: Museum of Comparative Zoology, Harvard University; TAMU: Texas A and M University, College Station); UKY: University of Kentucky, Lexington; USNM: National Museum of Natural History, Washington, D. C.; UWYO: University of Wyoming, Laramie.

Wing drawings were prepared by temporarily dry slide-mounting wings from ones side of selected specimens, and projecting these using a Ken-A-Vision X1000 microprojector onto paper for tracing and recording veins and pigmentation patterns.

Morphological terminology (including wing vein nomenclature) follows that of Sharkey and Wharton (1997) and Whitfield (1997). A diagram of this venational scheme as applied to *Deuterixys* is presented in Fig. 1.

Names of new species are to be attributed to both authors.

KEY TO NEW WORLD SPECIES OF *DEUTERIXYS* MASON

1. Tergite I of metasoma weakly hourglass-shaped, narrowing slightly in anterior half then widening again posteriorly (Fig. 9) .... ***Deuterixys colombiana*,** n. sp.
   Known so far only from mountains of the northern Andes and Santa Marta (Colombia) Ranges.

– Tergite I either narrowing or broadening posteriorly, or relatively parallel-sided, but not narrowest near midlength (Figs. 10, 11, 13, 14) 2

2. Tergite I of metasoma strongly narrowing posteriorly; tergite III less strongly sculptured than tergite II (Fig. 14) .... ***Deuterixys pacifica*** Whitfield
   North America, ranging well south in Mexico in mountains.

– Tergite I of metasoma either broadening posteriorly (Fig. 16), barrel-shaped (Fig. 15), or relatively parallel-sided; tergite III as strongly sculptured as tergite II 3

3. Tergite I at posterior end nearly as broad as anterior margin of tergite II, and broadening slightly posteriorly (Fig. 16); tergite III nearly as long medially as tergite II .... ***Deuterixys quercicola*** Whitfield

Western North America, ranging well south in Mexico in mountains.

– Tergite I posteriorly much narrower than anterior margin of tergite II, and more or less barrel-shaped or parallel-sided (Figs. 10, 12, 13, 15) 4

4. Tegulae strongly yellowish . . . . *Deuterixys bennetti* Whitfield

Gulf coast of U. S., Florida, widespread in Caribbean.

– Tegulae deep brown to blackish 5

5. Fore wing length > 2.3 mm; mesoscutum slightly depressed along courses of notauli, so that there is a suggestion of notauli in dorsal view; R1 (metacarp) only slightly longer than stigma (Fig. 5); tergite III of metasoma strongly and abruptly broader than tergite II, and only about 0.83as long as tergite II (Fig. 15) . . . . *Deuterixys hansoni*, **n. sp.**

Known from Costa Rica, tentatively also from Bolivia (both high elevation localities).

– Fore wing length < 2 mm; mesoscutum with no hint of notauli; R1 (metacarp) usually approximately 1.53 as long as stigma, sometimes shorter (Figs. 4, 8); tergite III of metasoma slightly broader than tergite II, usually nearly as long as tergite II medially (Figs. 10, 12) 6

6. Scutellum and posterior 0.2 of mesoscutum polished and nearly impunctate; much or all of head and anterior portions of mesosoma often deep reddish-brown rather than black . . . . *Deuterixys erythrocephala* **n. sp.**

Lower elevations in Antilles and Trinidad; questionably also from Argentina.

– Scutellum, and usually also posterior 0.2 of mesoscutum with distinct punctation; head black and thorax mostly black(Veracruz) . . . . *Deuterixys tehuantepeca* **n. sp.**

So far known from mountains of southern Mexico and Central America.

Deuterixys bennetti Whitfield

Figs. 2, 13

The neotropical specimens of this previously described species are redescribed for comparison with the other species.

Female and male.—Body size: Overall length 1.9 mm; fore wing length 1.9 mm. *Head:* Antennae approximately same length as body; scapes and pedicels vivid yellow, remainder of antennae fulvous-brown; basal 9 flagellomeres with black basal, distal and intermediate patches; apical 6–7 flagellomeres with only one rank of placodes; 2nd flagellomere 3× as long as broad; 14th and 15th flagellomeres approximately 1.5× as long as broad. Head dark brownish black. Clypeus and genae reddish brown; labrum and mandibles, except brown teeth, vivid yellow; glossa and palpi whitish yellow. Frons nearly 1.25× as broad at midheight as midlength; inner margins of eyes weakly converging towards clypeus. Punctation of head indistinct. *Mesosoma:* Prosternum fulvous with yellow margins. Mesoscutum black, with lateral dark fulvous patches posteriorly; shallowly punctate, becoming less distinctly and more scarcely punctate posteriorly. Scutellar disc sparsely, shallowly punctate throughout. Propodeum dark reddish brown with margins and medial longitudinal carina black, highly polished, virtually unsculptured except for medial and lateral longitudinal strong carinae and very weak transverse ridging in inmediate vicinity of longitudinal carina midbasally. *Legs:* Legs mainly yellowish, with prothoracic coxae and trochanters, mesothoracic coxae and trochanters and metathoracic trochanters pale. Distal half of mesothoracic tibiae and mesothoracic tarsi fulvous. Metathoracic legs with distal extreme of femora and tibiae, and tarsi fully brown. Hind apical tibial spurs short, whitish, subequal in length. *Wings:* Tegulae vivid yellow. Stigma 2.8× as long as broad. Metacarp (R1) of fore wing slightly longer than pterostigma; r and 2Rs subequal in length and meeting at rounded, approximately 135 degree angle. Venation of fore wing, including stigma translucent pale yellow-brown. Costa and margin of

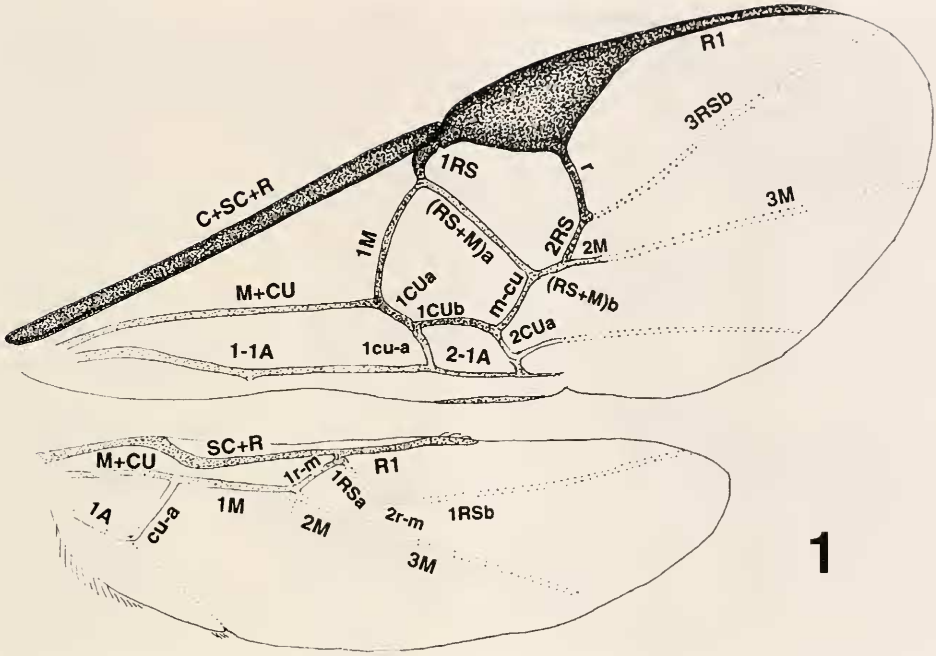


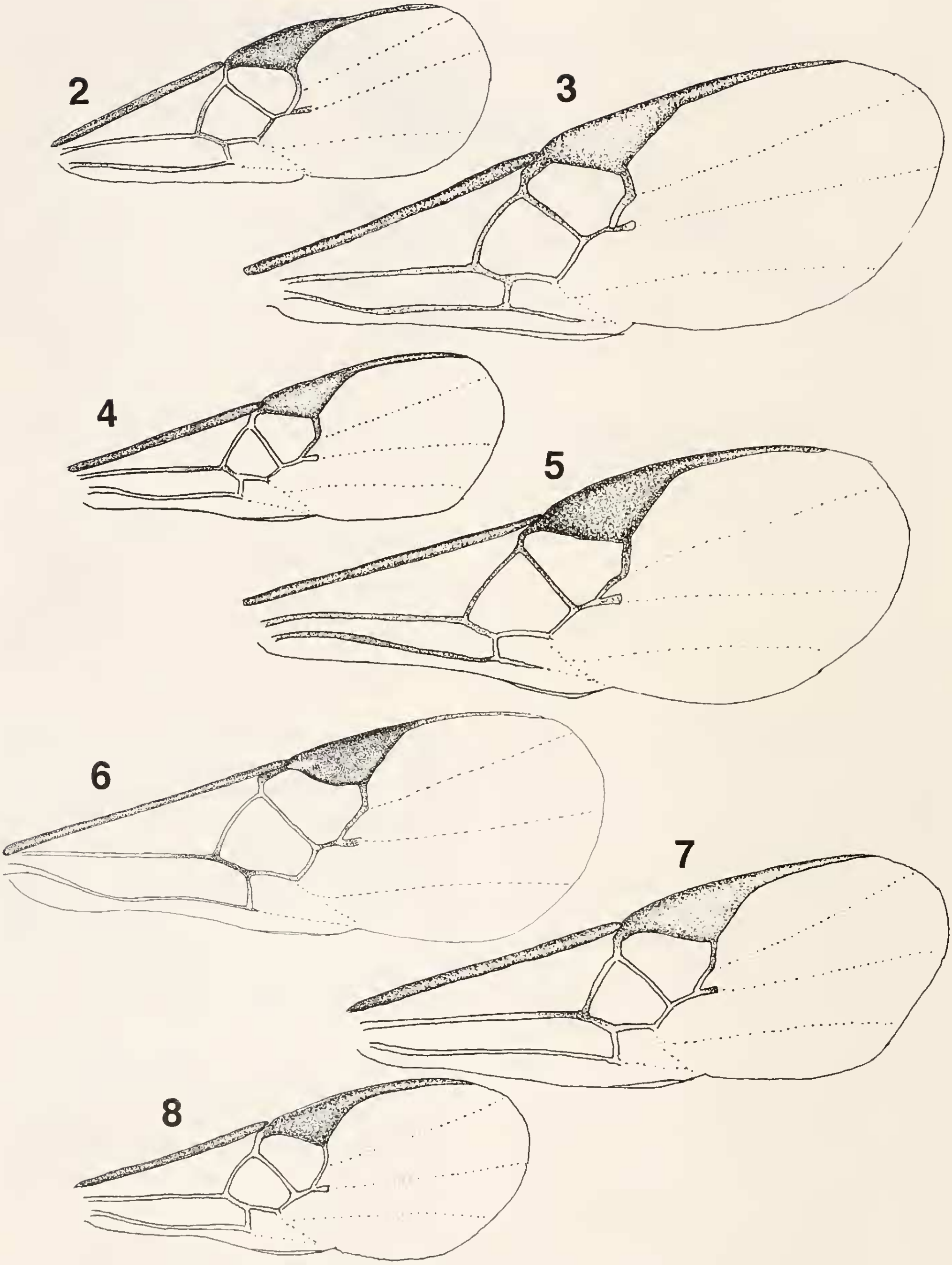
Fig. 1. Labelled diagram of wing veins, using the nomenclature adopted in Wharton et al. (1997) and in this paper.

pterostigma brown. *Metasoma:* Tergite I nearly 1.7× as long as posterior width, subparallel-sided, virtually parallel-sided, very slightly divergent anteriorly with strong longitudinal groove over anterior 0.3; coarsely aciculorugose over posterior 0.7. Tergite II and III subequal in length. Tergite II approximately 1.8× as broad anteriorly as long and a little more than 1.6× as broad posteriorly as long, with sharp anterolateral corners and posterior half virtually parallel sided; surface coarsely aciculorugose, medial raised portion sometimes distinctly demarcated by ridges. Tergite III separated from II by crenulate furrow, abruptly widening, becoming broader than tergite II at broadest point; surface longitudinally aciculorugose. Hypopygium short, blunt, with long hairs subapically. Ovipositor sheaths short, about as long as third metathoracic tarsomere, decurved, polished, with hairs concentrated apically. Tergites I, II and III black, rest of tergites brown. Laterotergites and apical margin of tergite III whitish. Apical margins of tergite IV and following tergites brownish yellow. Basal sternites yellowish, distal sternites and hypopygium fulvous-brown.

Material examined.—1♂, CUBA: Santa Clara Prov., San Juan Mts., Jan.–Feb. 1927 C. T. and B. B. Brues (MCZ); 1♀, DOMINICAN REPUBLIC: Loma el Penon, 676m, 23-III-1979, L. Masner (CNC); 1♀, 1♂, JAMAICA: Moneague, June, W. S. Brooks (MCZ).

Hosts.—Along the Gulf Coast of North America, *Bucculatrix* sp. (Lepidoptera: Bucculatricidae) on *Baccharis halimifolia* L. (Asteraceae) serves as host (Whitfield 1985); in the Neotropical region, the hosts are so far unknown.

Comments.—No other known species of New World *Deuterixys* has the tegulae so vividly yellowish, and the third metasomal tergite is also more evenly finely striate in sculpturing than other species in this Hemisphere. The Jamaican specimens are exceedingly small and less brightly colored than appears to be typical for the



Figs. 2–8. Fore wings. 2, *Deuterixys bennetti* Whitfield. 3, *D. colombiana* n. sp. 4, *D. erythrocephala* n. sp. 5, *D. hansoni* n. sp. 6, *D. pacifica* Whitfield. 7, *D. quercicola* Whitfield. 8, *D. tehuantepeca* n. sp.

species; it is possible that these represent a distinct species but our best guess at present, based on both morphology and distribution, is that they are dwarfed *D. bennetti.*

Deuterixys colombiana Whitfield and Oltra, n. sp.

Figs. 3, 9

Female and male.—Body size: Overall length 2.5–3.0 mm; fore wing length 2.5–3.0 mm. *Head:* Black, with palpi whitish amber. Antennae slightly longer than body, scapes dark brown yellow infuscate and pedicels brown, remainder of antennae brown. Apical 6 flagellomeres with only one rank of placodes. Second flagellomere 3.5–4.2× as long as broad, 14th and 15th flagellomeres 1.3× as long as broad. Inner margins of eyes weakly converging towards clypeus. Punctation of head indistinct. *Mesosoma:* Mesoscutum black, shallowly punctate anteriorly, becoming less distinctly and more sparsely punctate posteriorly. Scutellar disc sparsely, shallowly punctate throughout. Propodeum highly polished, virtually unsculptured except for medial and lateral longitudinal strong carinae, and weak transverse ridging in inmediate vicinity of longitudinal carina. Propodeum with basal half brownish black and distal half dark reddish brown. *Legs:* Prothoracic legs brown except whitish trochanters and yellowish fulvous distal half of femora and entire tibiae. Mesothoracic and metathoracic legs mainly brown, except tarsomeres darker and fulvous trochanters, apical extreme intermediate femora and basal extreme tibiae. Apical spurs of hind tibiae short, whitish, subequal in length. *Wings:* Tegulae dark brown. Stigma 2.8–3× as long as broad. Metacarp (R1) of fore wing slightly longer than stigma; r and 2Rs subequal in length and meeting at rounded to weakly angular, approximately 135 degree angle. Venation of fore wing light yellowish brown, stigma opaque, pale yellowish white; translucent and light brown in one exemplar. Costa and margin of stigma brown. *Metasoma:* Tergite I 1.8–1.9× as long as posterior width, narrowing in basal 0.4, with strong longitudinal groove over anterior 0.5–0.6; coarsely aciculorugose over posterior 0.6. Tergite II and tergite III subequal in length. Tergite II subquadrate, slightly broader anteriorly than posteriorly, approximately 1.7× as broad as long, surface coarsely aciculorugose, with parallel dense striations longitudinally, medial raised portion distinct. Tergite III separated from tergite II by crenulate groove, becoming abruptly wider than tergite II; surface longitudinally aciculorugose and medial raised portion as tergite II. Hypopygium short, blunt, with long hairs mainly concentrated apically. Ovipositor sheaths short, about as long as apical metathoracic tarsomere, decurved, polished, with hairs concentrated apically. Tergites I, II and III black, tergite IV dark brown and rest of tergites brown. Sternites fulvous-brown. Laterotergites, apical margins of tergite III and following tergites, and intersegmental membranes mainly whitish.

Hosts.—Unknown.

Material examined.—Holotype ♀: COLOMBIA: Caldas, 3300–3500m, 5°15′N, 76°25′W 3-IV-1973, J. Helava, (CNC). PARATYPES: 5♀, 6♂, same data, also 1♂, Antioquia, 1800m, 7°5′N, 76°30′W, 18-22-IV-1973, J. Helava, (CNC), 1♂, Putumayo, 2900m, 1°10′N, 77°15′W, 2-XII-1972, J. Helava (CNC). Other material: 2♀, 1♂, COLOMBIA: Magdalena, PNN S. Nevada de Santa Marta, El Ramo, 2500m, 24-30-VI-2000, J. Castillo, J. Varela (Humboldt, UKY). ECUADOR: 1♂, Napo, above Papallacta, 3500m, 21-II-1983 (AEI), L. Masner; 1♂, Napo, above Papallacta, 3200m, 14-II-1983, Masner and Sharkey (AEI); 1♂, Pimo (N. Cañar), 3200m, 10-12-XII-1970, L. E. Peña (AEI). PERU: 1♀, San Jeronimo, 10 km E. Cusco, Feb.–Mar. 1978, P. M. Marsh (USNM).

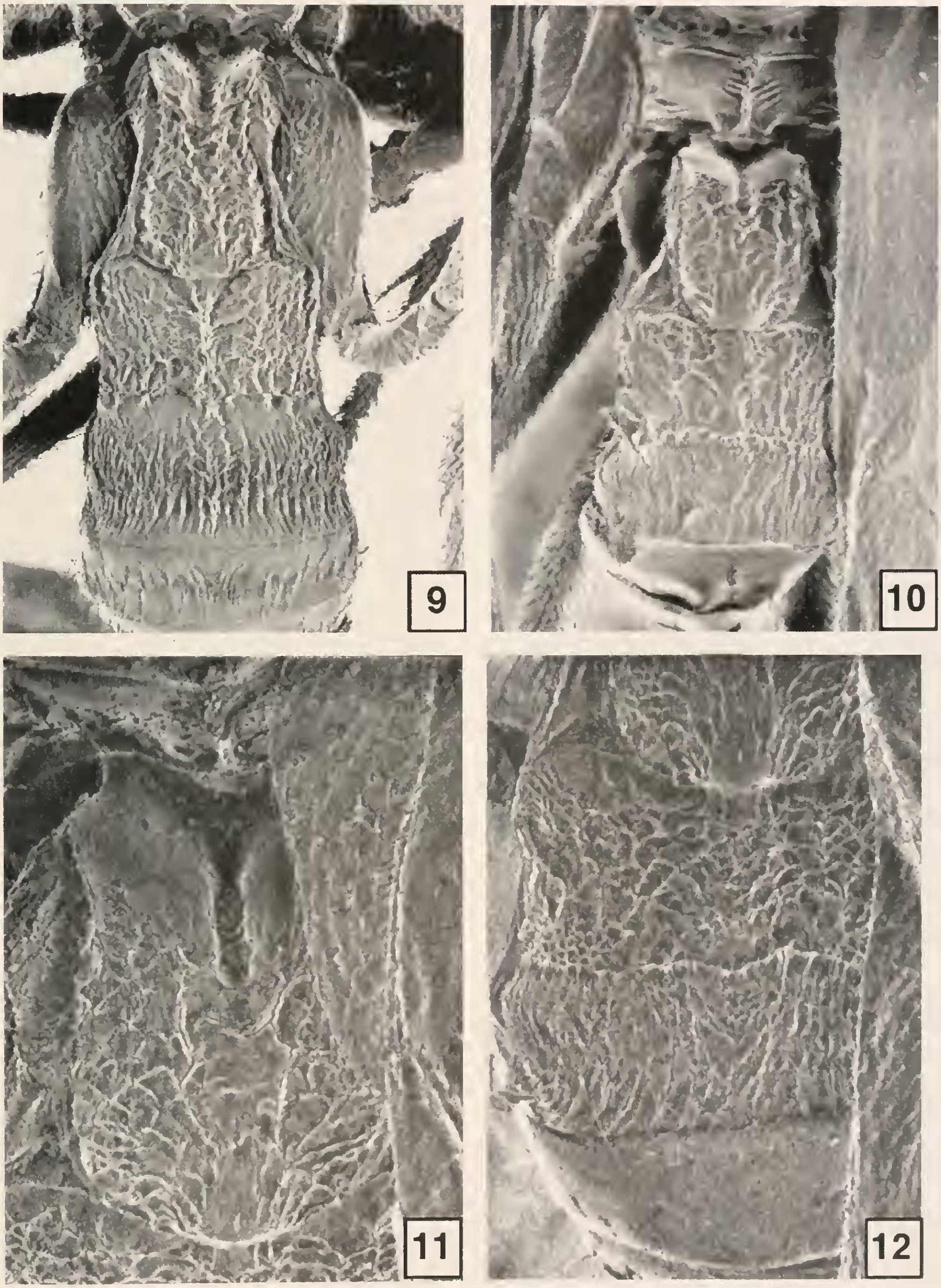
Comments.—Tergite I of this species is similar to some specimens of *D. rimulosa*

(Niez.) from the east of Spain, but it can be easily distinguished from this Palaearctic species by its possession of the combination of following features: 1) metacarp longer than stigma, 2) metasomal tergite I with strong narrowing in basal half, forming an hourglass shape in females (more parallel-sided in males), and 3) coarsely aciculorugose surface of tergites II and III. The relatively long tergite II, in combination with the very coarse sculpturing, is diagnostic for this species in the New World fauna. This species is known currently only from the northern Andes, and from the isolated Santa Marta range in northern Colombia.

Deuterixys erythrocephala Whitfield and Oltra, n. sp.

Figs. 4, 10

Female.—Body size: Overall length 1.7–1.8 mm; fore wing length 1.8–1.9 mm. *Head:* Antennae approximately as long as body; scapes and pedicels fulvous in upper part and vivid yellow in lower part, remainder of antennae brown; basal 8 flagellomeres with black basal, distal and intermediate patches; apical 8–9 flagellomeres with only one rank of placodes; 2nd flagellomere 3–4× as long as broad; 14th and 15th flagellomeres from 1.2× up to nearly 1.7 as long as broad. Head dark reddish brown in dorsal view; frons, clypeus deep fulvous to brown; labrum and mandibles, except brown teeth, vivid yellow; glossa and palpi whitish yellow. Frons from 1.3×–1.5× as broad at midheight as midlength; inner margins of eyes virtually parallel to slightly divergent ventrally towards clypeus. Punctation of head indistinct in dorsal view, punctation of face superficial, giving impression of even rugosity. *Mesosoma:* Prosternum dark fulvous to reddish brown. Mesoscutum mostly dark fulvous to reddish brown, with lateral and medial black patches posteriorly; shallowly punctate, becoming impunctate over posterior 0.2. Scutellar disc punctate virtually throughout, evenly convex. Propodeum dark reddish brown with margins and medial longitudinal carina black, highly polished, virtually unsculptured except for medial and lateral longitudinal strong carinae and transverse ridging in inmediate vicinity of three carinae. *Legs:* Prothoracic legs whitish yellow except fulvous distal tarsomere. Mesothoracic legs with trochanters light yellow, coxae and femora fulvous, tibiae light fulvous and tarsi yellowish except fulvous distal tarsomere. Metathoracic legs mostly dark fulvous, except yellowish white trochanters and basal third to half of tibiae, and brown zones of tibiae and tarsi more dark. Apical spurs of hind tibiae short, whitish, subequal in length. *Wings:* Tegulae dark fulvous to brown. Stigma 2.75× as long as broad. Metacarp (R1) of fore wing up to 1.3× length of stigma; r and 2Rs subequal in length and meeting at slightly rounded, approximately 135 degree angle. Venation of fore wing, including stigma, translucent, very pale to yellowish brown (stigma can appear opaque whitish in some preserved specimens). Costa and margin of pterostigma brown. *Metasoma:* Tergite I from 1.5 × up to 2× as long as posterior width, virtually subparallel-sided, broadening shallowly in distal third and narrowing slightly posteriorly, with strong longitudinal groove over anterior 0.3–0.4; coarsely aciculorugose over posterior 0.6–0.8. Tergite II slightly longer than III. Tergite II parallel-sided, from 1.6× up to 2× as broad as long; surface coarsely aciculorugose, medial raised portion almost indistinct. Tergite III separated from II by crenulate furrow, abruptly widening, becoming broader than tergite II; surface longitudinally aciculorugose. Hypopygium short, blunt, with scattered long hairs subapically. Ovipositor sheaths short, about as long as second /third metathoracic tarsomere, decurved, polished, with hairs concentrated apically. Tergites I, II and III black, occasionally shading more reddish brown, rest of tergites brown. Laterotergites and ster-



Figs. 9–12. Metasomal tergites, dorsal view: 9, *Deuterixys colombiana* n. sp. 10, *D. erythrocephala* n. sp. 11, 12, *D. tehuantepeca* n. sp.

nites whitish, distal sternites and hypopygium fulvous-brown.

Material examined.—HOLOTYPE ♀: TRINIDAD: Curepe, 21-VII-1978, malaise trap (no collector given) (CNC). PARATYPES: 1♀, same data but XII. 1977 (CNC); 1♀, DOMINICAN REPUBLIC: La Cumbre, 400m, 21-III-1978, L. Masner (CNC). More doubtful determination: ARGENTINA: 1♀, Tucumán, Horco Molle, 10-15-V-1968, no collector listed (MCZ).

Hosts.—Unknown.

Comments—This species can be easily distinguished from the other species in the New World by its possession of the following combination of features: 1) tegulae dark brown, 2) posterior 0.2 of mesoscutum and scutellum virtually impunctate, and 3) portions of head and mesosoma reddish brown rather than black. This latter feature gives the species its name. The specimen from Argentina seems virtually identical in structural details, but is darker in general coloration. The Trinidad specimens differ in some minor details (especially coloration) from the Dominican Republic specimen, but we consider them conspecific due to their joint possession of the distinctive features listed above.

Deuterixys hansoni Whitfield and Oltra, n. sp.

Figs. 5, 15

Female.—Body size: Overall length about 2.1 mm; fore wing 2.5 mm. *Head:* Length of antennae 2.5 mm; antennae dark brown, pedicels infuscate of dark fulvous; apical 6 flagellomeres with only one rank of placodes; 2nd flagellomere 3.3× as long as broad; 14th flagellomere about 1.5× as long as broad. Head black, clypeus dark brown, labrum and mandibles light fulvous infuscate with brown; glossa and palpi yellowish white. Frons about 1.5× as broad at midheight as midlength; inner margins of eyes virtually parallel towards clypeus. Punctation of head superficial, dense, giving impression of even rugosity, especially in the face. *Mesosoma:* Prosternum black. Mesoscutum black; punctation shallow and dense, becoming impunctate near posterior margin; courses of notauli somewhat depressed, so there is a suggestion of notauli. Scutellar disc black, sparsely and very shallowly punctate, evenly convex. Propodeum black, mostly polished, sculptured by medial and lateral longitudinal strong carinae and transverse ridging of three carinae giving impression of even irregularity. *Legs:* Prothoracic and mesothoracic coxae dark brown, metathoracic coxae black. Prothoracic legs with trochanters and femora yellow, femora dark brown, infuscate basally; with tibiae and tarsi dark fulvous, distal tarsomere brown. Mesothoracic legs with trochanters reddish brown, femora dark brown and yellowish distally, tibiae gradually changing from fulvous basally to brown distally, tarsi light brown with distal tarsomere dark brown. Metathoracic legs with trochanters and femora dark brown, femora reddish infuscate, approximately basal third tibiae fulvous with the rest dark brown-fulvous, with tarsi dark brown. Hind apical tibial spurs short, whithish, subequal in length. *Wings:* Tegulae black. Stigma 2.4× as long as broad. Metacarp (R1) of fore wing as long as stigma, r and 2Rs subequal in length and meeting at about 130 degree angle. Venation of fore wing mostly brown, discoloured basally; stigma opaque, whitish yellow; costa and margins of stigma brown. *Metasoma:* Tergite I 2.2× as long as posterior width, barrel-shaped, very weakly widening posteriorly, with strongly rounded apical corners so than greatest width of distal third is nearly 1.5× as broad as distal width; with strong longitudinal groove over anterior 0.4; coarsely rugose over posterior 0.8. Tergite II slightly longer than III, with subparallel sides, shallowly divergent anteriorly, with strong anterolateral corners; surface coarsely aciculorugose, medial raised portion almost indistinct and narrow. Tergite II about 1.6× as broad as long. Tergite III separated from II by crenulate furrow, abruptly widening, becoming broader than tergite II at broadest point; surface longitudinally aciculorugose. Tergite IV shallowly rugose, remaining tergites polished. Hypopygium short, blunt, with long hairs apically. Ovipositor sheaths short, about as long as second metathoracic tarsomere, decurved, polished, with hairs concentrated in apical half. Tergites I, II, III and IV black, rest of tergites dark reddish brown. Laterotergites and apical margins of tergites III and IV whitish, basal sternites fulvous-brown. Distal sternites and hypopygium brown.

Material examined.—HOLOTYPE ♀: COSTA RICA: San Jose, 16 km S. Empaime, 2600m, II-IV-1989, P. Hanson and I. Gauld (UWYO). More doubtfully associated: BOLIVIA: 1♀, La Paz, Rio Zongo, 3200m, 22-X-1984, L. Peña (AEI).

Hosts.—Unknown.

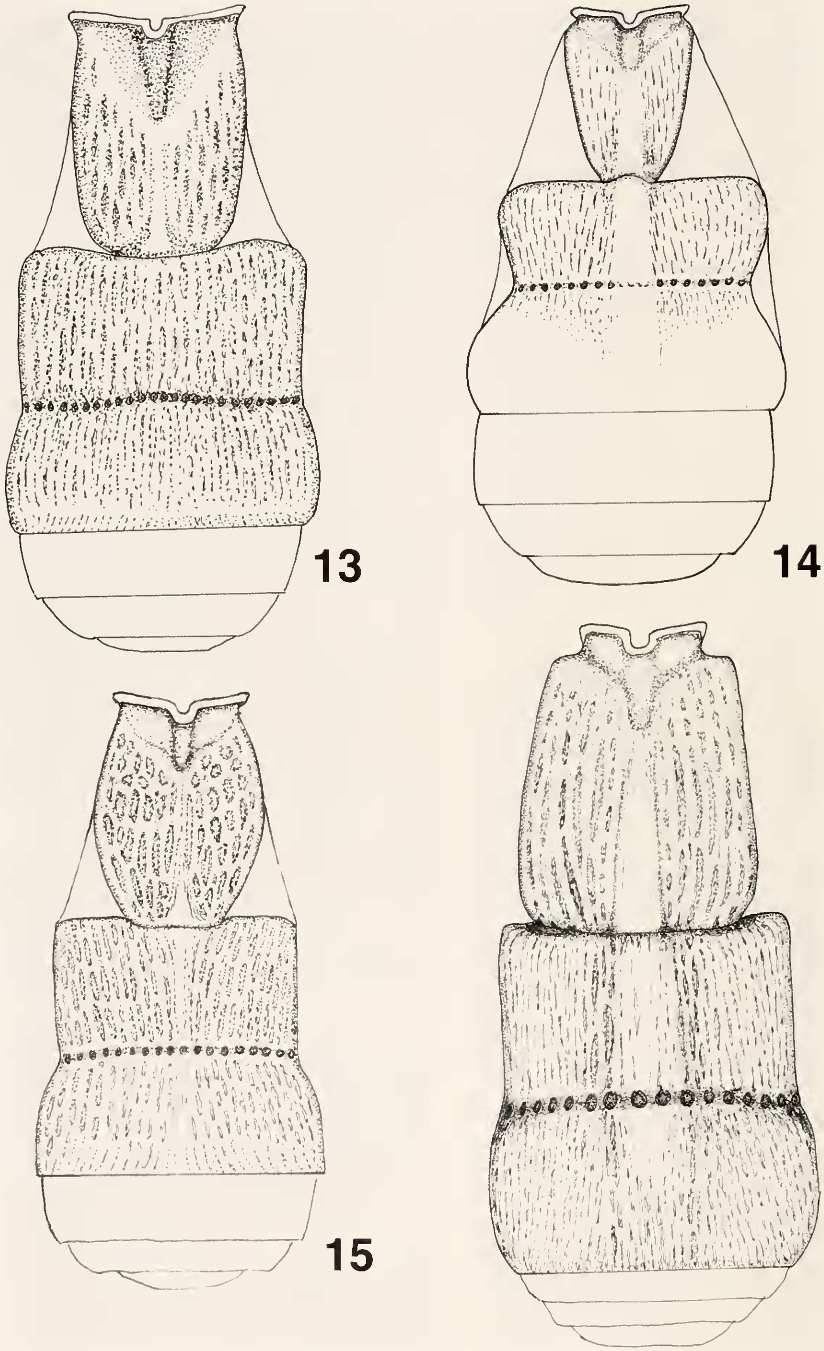
Comments.—This is one of the larger species of *Deuterixys*. It differs from the superficially similar species such as *D. bennetti*, *D. erythrocephala* and *D. tehuantepeca* by its possession of the following combination of features: 1) weak suggestion of notauli on mesoscutum, 2) metacarp about as long as stigma, 3) tergite I weakly widening posteriorly, 4) tergite III abruptly wider than tergite II and about 0.75 length of tergite II. In general the anterolateral corners of tergite II are also more rectangular than in the other species. The Bolivian specimen appears to be distributionally disjunct, but since the specimens are from high elevation and rarely collected this may not mean much. The species is named for Dr. Paul Hanson, of the University of Costa Rica, who has contributed substantially to our knowledge of Costa Rican Hymenoptera.

Deuterixys pacifica Whitfield

Figs. 6, 14

Neotropical specimens of this previously described Nearctic species redescribed for comparison.

Female and male.—Body size: Overall length about 1.9 mm; fore wing approximately 2 mm. *Head:* Antennae nearly as long as body; apical 8 flagellomeres with only one rank of placodes; 2nd flagellomere 2× as long as broad; 14th and 15th flagellomeres about 1.4× as long as broad. Antennae brown. Head black in dorsal view, brown in frontal view, labrum and mandibles, except light fulvous teeth, fulvous-brown; glossa whitish fulvous; palpi light brown. Frons 1.3× as broad at midheight as midlength; inner margins of eyes virtually parallel towards clypeus. Punctation of head virtually indistinct in dorsal view, punctation of face superficial, crowded, giving impression of even rugosity. *Mesosoma:* Mesosoma mainly black dorsally and ventrally; axillae adjacent to scutellum, metanotum and propodeum dark reddish brown. Punctation of mesoscutum shallow and fine, rough and more crowded in courses of notauli. Scutellar disc shallowly punctate, punctation crowded giving impression of even rugosity laterally and posteriorly. Propodeum dark reddish brown with black margins and mid-longitudinal carina, very polished, virtually unsculptured except for strong medial and lateral longitudinal carinae and very little, superficial, transverse ridging in immediate vicinity of medial carina. *Legs:* Generally for the most part brown, more reddish from coxae through femora inclusive; prothoracic femora distally and metathoracic tibiae basally yellowish. Hind apical tibial spurs short, whitish, subequal in length. *Wings:* Tegulae black. Stigma 2.4× as long as wide. Metacarp (R1) and stigma of fore wing subequal in length; 2Rs 1.25× as long as r and meeting at about 130 degree angle. Venation of fore wing mostly light brown, paler basally; stigma opaque, brown, more light basally; costa brown. *Metasoma:* Tergite I 3.4× as long as posterior width; subparallel-sided anteriorly, evenly and weakly narrowing over about posterior 0.7, rounded, convergent posteriorly; with strong longitudinal groove about over an-



Figs. 13–16. Metasomal tergites, dorsal view. 13, *Deuterixys bennetti* Whitfield. 14, *D. pacifica* Whitfield. 15, *D. hansoni* n. sp. 16, *D. quercicola* Whitfield.

terior 0.5; coarsely rugose over posterior 0.6. Tergite III 1.4× as long medially as II. Tergite II about 2.2× as broad medially as long, virtually parallel-sided, narrowing slightly posteriorly; surface evenly rugose, medial raised portion little evident. Notch between tergites II and III evident. Tergite III separated from II by narrow crenulate furrow, rounded laterally, becoming broader than tergite II at broadest point; surface weakly rugose. Hypopygium short, blunt, with long hairs subapically. Ovipositor sheaths short, near as long as third and fourth metathoracic tarsomeres together, decurved, polished, with hairs concentrated apically. Tergites I, II and III mostly black, except reddish brown smooth zone basally on tergite I and fulvous zone subdistally on tergite III; rest of tergites brownish fulvous. Dorsal portions of laterotergites fulvous. Remaining area of laterotergites and apical margin of tergites III, IV and V whitish. Sternites brown, sterna of basal segments little lighter, hypopygium fulvous-brown.

Material examined.—1♀, MEXICO: Michoacan, 2 mi. S. Carapan, 6-VII-1985, Woolley and Zolnerowich (TAMU); 1♂, San Luis Potosi, 7.2 mi. E. San Luis Potosi, 3-VII-1987, G. Zolnerowich (TAMU). Three specimens have also been seen from the Rocky Mountains in Wyoming (material in UWYO collection), adding to the range from the original description.

Hosts.—In western North America, this species attacks *Bucculatrix* spp. on sagebrush and a broad range of other composites (Whitfield 1985); possibly this also goes for the Mexican material.

Comments.—This species is distinctive among the New World species in having the first tergite so strongly narrowed, and in having the third tergite much less strongly sculptured than the second. It resembles the Palearctic *D. rimulosa* Niez., but has the first tergite more strongly narrowed posteriorly.

Deuterixys quercicola Whitfield

Figs. 7, 16

Neotropical specimens of this previously described species are redescribed for comparison.

Female and male.—Body size: Overall length approximately 2 mm; fore wing about 2 mm. *Head:* Antennae as long as body, black, 2nd flagellomere 4× as long as broad, 14th flagellomere approximately 1.4× longer than broad. Head black, clypeus black, labrus and mandibles reddish brown; glossa brownish yellow, palpi yellowish white. Posterior ocelli brownish red, opaque; anterior ocellus yellow, translucent. Frons nearly 1.2× as broad at midheight as midlength; inner margins of eyes divergent towards clypeus. Head in dorsal view smooth and very polished; punctation of face superficial, crowded, giving impression of even, shallow rugosity. *Mesosoma:* Mesosoma black dorsally and ventrally. Punctation of mesoscutum shallow, becoming impunctate posteriorly. Scutellar disc mostly smooth and very polished, with light punctation anterolaterally. Propodeum black, very polished, shining, virtually unsculptured except for medial and lateral longitudinal strong carinae, and weak, little extensive, transverse ridging in inmediate vicinity of carinae. *Legs:* Prothoracic legs mostly brownish yellow with coxae, basal two thirds of femora and last tarsomere blackish. Mesothoracic legs with black coxae and femora, tibiae brown and tarsi yellowish brown. Metathoracic legs mainly black, with two fifth basal of tibiae fulvous. Apical outer spur of hind tibiae shorter than half length of tibia. *Wings:* Tegulae black. Metacarp (R1) and stigma of fore wing subequal in length; 2Rs sligthly longer than r and meeting at rounded, approximately 135 degree angle. Stigma about 2.7× as long as wide. Venation of fore wing brown, stigma translucent yellowish brown. Costa dark brown. *Metasoma:* Tergite I 1.5× as long as posterior width, subparallel-sided, slightly broadening in distal 0.4, with strong longitudinal groove over anterior 0.3; coarsely aciculorugose longitudinally over about distal 0.8 with a smooth and polished zone mid-longitudinally. Tergite II and III subequal in length. Tergite II subparallel-sided, about 1.7× as broad as long; sculpture coarsely aciculorugose, more densely so laterally, medial raised portion almost indistinct. Notch between tergites II and III barely evident. Tergite III separated from II by crenulate furrow, becoming shallowly broader than tergite II; sculpture longitudinally aciculorugose, more fine and dense posteriorly. Of remaining tergites, only tergites IV and V visible, tergite V short and overlapped by IV. Tergite IV with fine longitudinal sculpturing over most of its surface. Hypopygium short, blunt, with sparse long hairs. Ovipositor sheaths short, near as long as second metathoracic tarsomere, decurved, apically hairy. Metasoma mostly black, basal sternites dark fulvous.

Material examined.—1♀, MEXICO: Tamaulipas, Mun. Tula, La Presita, Canon de Coyote, 1900m. 16-III-1987, P. Kovarik, R. Jones, R. Trivino (TAMU). 1♂, MEXICO: Durango, 6 mi. W. La Ciudad, 9000′, 11-VI-1964, W.R.M. Mason (CNC).

Hosts.—In western North America, this species parasitizes *Bucculatrix* spp. primarily on oaks (*Quercus* spp.). This is possibly true also for the Mexican material, but there are no rearing records there.

Comments.—No other New World *Deuterixys* species has the posterior margin of the first metasomal tergite nearly as broad as the second tergite. This species seems to range widely especially in scrubby savannah-like vegetation south from North America well into southern Mexico.

Deuterixys tehuantepeca Whitfield and Oltra, n. sp.

Figs. 8, 11, 12

Female and male.—*Body size:* Overall length about 1.9 mm; fore wing approximately 1.9 mm. *Head:* Antennae as long as body; scapes and pedicels fulvous in upper part with brown distal half of pedicels, and yellow in lower part, remainder of antennae brown; apical 8 flagellomeres with only one rank of placodes; 2nd flagellomere approx. 3× as long as broad; 14th and 15th flagellomeres 1.25× and 1.4× as long as broad respectively. Head black frontally and dorsally, clypeus brown; labrum and mandibles, except brown teeth and infuscate basal part of mandible, yellow; glossa and palpi whitish. Frons slowly broader at midheight than midlength; inner margins of eyes divergent towards clypeus. Punctation of head virtually indistinct in dorsal view, punctation of face superficial, crowded, giving impression of even rugosity. *Mesosoma:* Mesosoma generally black to dark reddish brown dorsally and ventrally. Punctation of mesoscutum shallow, becoming impunctate posteriorly. Scutellar disc sparsely and very shallowly punctate, evenly convex. Propodeum dark reddish brown with margins and medial-longitudinal carina black, polished, virtually unsculptured except for medial and lateral longitudinal strong carinae and transverse ridging in immediate vicinity of the three carinae. *Legs:* Prothoracic legs mostly yellowish white, with coxae basally and tarsi distally fulvous infuscated. Mesothoracic legs with coxae fulvous ventrally, brown dorsally; trochanters yellowish fulvous; fulvous femora infuscate basally and dorsally; tibiae and tarsi whitish yellow, apical tarsomeres fulvous. Metathoracic legs mainly brown except trochanters and basal two-thirds of tibiae yellowish fulvous. Apical spurs of hind tibiae short, whitish, subequal in length. *Wings:* Tegulae dark reddish brown. Stigma from 2.5× up to near 2.8× as long as wide. Metacarp (R1) of fore wing almost 1.2× as long as stigma; r and 2Rs subequal in length and meeting at rounded, approximately 135 degree angle. Venation of fore wing mostly light brown, paler basally; stigma opaque, pale to light brown; costa brown. *Metasoma:* Tergite I about 2–2.2× as long as posterior width, parallel-sided to slightly broadening posteriorly, posterior corners rounded, with strong longitudinal groove over anterior 0.5; coarsely aciculorugose over posterior 0.7. Tergite II slightly longer medially than III, about 1.75× as broad medially as long, with virtually parallel sides; surface scrobiculate, medial raised portion almost indistinct, wide. Notch between tergites II and III barely evident. Tergite III separated from II by crenulate furrow, this more evident medially; tergite III becoming slightly broader than tergite II; sculpture longitudinally aciculorugose. Hypopygium short, blunt, with long hairs subapically. Ovipositor sheaths short, near as long as distal metathoracic tarsomere, decurved, with hairs concentrated apically. Tergites I, II and III dark brown to black. Tergites IV, V and VI brownish fulvous, polished; rest of tergites fulvous. Laterotergites and apical margin of tergites IV, V and VI whitish. Basal sternites yellowish, remaining sternites and hypopygium fulvous-brown.

Material examined.—HOLOTYPE ♀: GUATEMALA: Antigua, 1500–1600m, VII-1980, N. L. H. Krauss (CNC). PARATYPES: 1♂, same data; 1♀, MEXICO: Oaxaca, 5.7 mi. SE Quiotepec, 2100′, 21-VII-1987, Woolley and Zolnerowich 87/053 (TAMU), 1♀, Veracruz, 3 mi. E. Huatusco, 23-VII-1984, J. B. Woolley 84/049b (TAMU).

Hosts.—Unknown.

Comments.—This species differs from *D. erythrocephala* in the distinctness of the punctation posteriorly on the mesoscutum and on the scutellum, and in having the mesosoma completely dark; from *D. bennetti* it differs in having dark tegulae, and from *D. hansoni* in being much smaller, having a slightly longer metacarp and in having the third metasomal tergite not so strongly broader than the second. It is not similar enough to the other species to be confused. So far it has only been found in the general region of the Isthmus of Tehuantepec, hence the specific epithet.

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